

therefore, establishes a singular approximation between two other great classes of Echinodermata, the Ophiuridæ and the Stelleridæ.—*Comptes Rendus*, July 10, 1882, p. 61.

A Word respecting Mr. Distant's Notes on Euplœa Castelnau.

By A. G. BUTLER.

It was not my intention to take further notice of Mr. Distant's observations respecting this species; but his assertion that I charged the Secretary of the Linnean Society with cutting out inverted commas from my MS. compels me to make some reply, if only to state what I really did say.

I told Mr. Distant that, to the best of my belief, I had inserted inverted commas in some of my papers* in which the date of the second volume of the 'Novara' was quoted, and that, so far as I could recollect, such was the case in my paper published in the 'Linnean Transactions;' as to any mention of the Secretary of the Society, I can only say that Mr. Distant's memory must be misleading him.

Mr. Distant is surely aware that not a few entomological papers have been antedated, not in consequence of a tendency to mendacity on the part of those who have thus unfairly claimed priority, but simply from their maintaining that the distribution of a few proof-sheets is equivalent to publication; he forgets, moreover, that in his defence of one entomologist, he impugns the veracity of others.

Lastly, I must disclaim any dissatisfaction with Mr. Distant's preference of the name *E. Castelnau* to that of *E. phæbus*; I only object to his stating that I used my name in preference to Felder's, knowing that the latter had priority. I regret that in a work, admirable in every other respect, the author has gone out of his way to make an assertion so unfounded.

On Crenothrix Kühniana (Rabenhorst), the Cause of the Infection of the Waters at Lille. By M. ALF. GIARD.

The reddish colour, bad taste, and unpleasant odour presented at times by the water of the Emmerin springs which supply the town of Lille have long been noticed by the population of that town; but in the spring of this year the infection assumed alarming proportions. On the 22nd of April the water was absolutely unusable; and from that time every somewhat copious rainfall was followed by a longer or shorter period of more or less intense infection. During these periods the water carries on its surface a ferruginous red scum which can easily be collected by stretching cloths across the stream. Ferruginous deposits also form in the reservoirs and in certain parts of the distributing channels. These on certain days were so abundant that the horses refused to drink the water which was offered to them. A microscopic examination showed that the cause of the infection was a Schizomycete, *Crenothrix Kühniana*, Rabenh., the filaments of which become charged, in contact with the water exposed to the air, with a precipitate of sesquioxide of iron, then putrefy, and communicate a most disagreeable flavour to the water.

* In my paper on *Hestia* I used a note of interrogation with the date 1867.

This *Crenothrix* has been noticed in several localities, especially Halle, Breslau, and Berlin, and has been carefully studied by Professors F. Cohn, O. Brefeld, and W. Zopf. To the observations of those eminent botanists we have only to add that the microgonidia, formed in the swollen extremities of the tubes of *Crenothrix* by transverse division of the bacillar joints constituting those extremities, are animated during some time with an active motion, due to the existence of a flagellum. The latter is visible only with the highest magnifying power (Hartnack immersion objective no. 12).

The gonidia afterwards give birth to an irregular form (*Merismopædia*), which is soon transformed into a mass of *Zooglææ* similar to a *Palmella*, and finally into regularly cylindrical tubes of various lengths.

The causes which have brought about the exaggerated development of *Crenothrix* in the Emmerin waters are evidently manifold. The soil was prepared by industrial dejections, especially those from distilleries, which discharge nitrates in abundance into the water-bearing stratum, at certain places very near the surface. The sources are, moreover, in the vicinity of swamps and ponds, like those of Tegel in the environs of Berlin.

Last winter having been relatively dry, the water-level was lowered about 5 metres. The rains of the spring and the beginning of the summer suddenly raised it, and carried with them the vegetable productions or the animals which had been developed in the humid earth.

While at Lille the *Crenothrix* was thus brought in abundance into the Emmerin reservoirs and the water-pipes, several wells at Tourcoing furnished balls of a fine Oligochæte worm (*Phreoryctes Menkeanus*), till then unknown in France.

Lastly, a portion of the aqueduct is dug in the aquiferous chalk; and it was thought needless to arch over that part; moreover, inlets have been pierced in order to increase by drainage-water the supply furnished by the springs. Every time that the flow of the water is made more rapid, in that part of the aquiferous layer a veritable aspiration is produced, which carries into the aqueduct the spores and filaments of the *Crenothrix*, which a slower and more complete filtration would have retained in the soil.

To remedy this scourge, we at first advised to do away with the latter source of contamination, against which it is comparatively easy to guard. But we believe that this palliation would be insufficient while the channels are sown with the innumerable spores of the Schizomycete. We shall doubtless be obliged to have recourse to filters of sand, similar to those recommended at Berlin by Zopf and Brefeld.

Towns establishing new systems of canals of potable water will do well, in order to avoid the *Crenothrix*, to take the sources in the deep strata, to avoid waters containing salts of protoxide of iron (necessary to the vegetation of this Schizomycete), and to prefer to subterranean waters the more aerated waters of lakes remote from all industrial establishments.—*Comptes Rendus de l'Académie des Sciences*, July 31, 1882, t. xcv. pp. 247-249.



Giard, Alfred. 1882. "On Crenothrix Kühniana (Rabenhorst), the cause of the infection of the waters at Lille." *The Annals and magazine of natural history; zoology, botany, and geology* 10, 263–264.

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